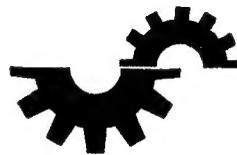


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PHOTOS AND FEATURES ON CHINESE INDUSTRY

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25X1 CHINA [REDACTED] PEI-CHING 39 55 N 116 24 E
Stone density meter manuf by Pei-ching Geol. Instrument Fty; measures the
humidity & density of rocks which do not dissolve in water. 1966.
Confidential (4,25) CIA 1147636

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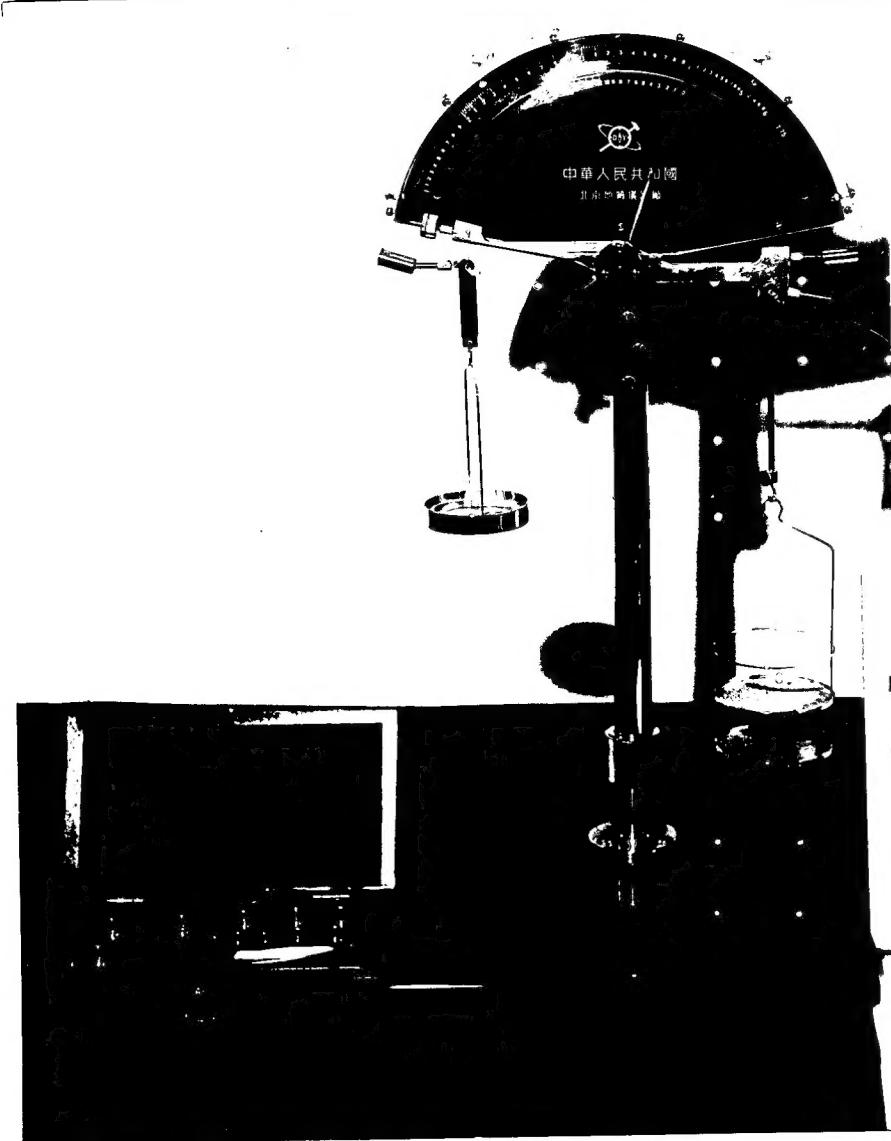
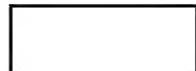
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CHINA
Stone density meter manuf. by Pei-ching Geological Instrument Fty; measures the humidity & density of rocks which do not dissolve in water.
1966. Confidential (4) CIA 1147636

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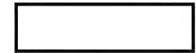
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CHINA D-0492 CHEKIANG PROV.
Surveying team fr. Soil Rsch. Inst of Chinese Acad. of Sciences making
study of loess soils in S part of prov. 1966. (1,4,8) CIA 1147634
Confidential

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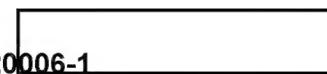
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CHINA [REDACTED] SHANG-HAI 31 14 N 121 28 E
Electronic automatic voltmeter manuf. by Shang-hai Geological Instrument Fty; measures differences in potential of DC meters used in geol. studies. 1966. Confidential (4,25) CIA 1147635

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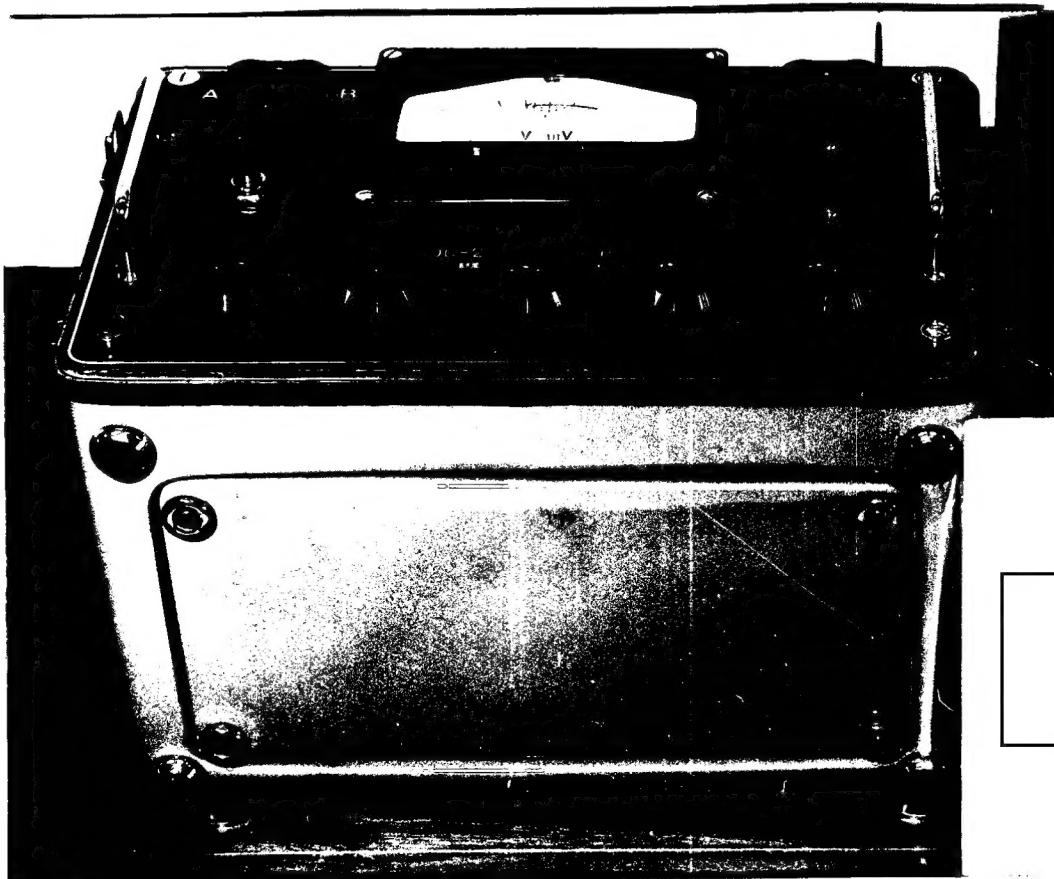
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Electronic automatic voltmeter manuf. by Shang-hai Geological Instrument
Fty; measures differences in potential of DC meters used in geol studies.
1966. Confidential (4) CIA 1147635

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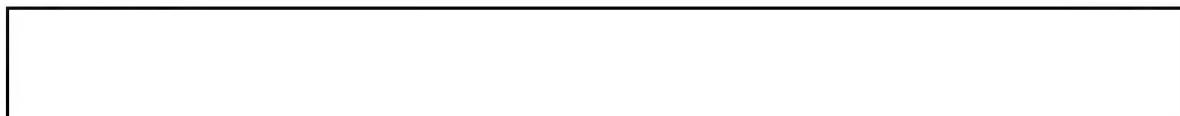
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CHINA
Chicom manuf. BaT C3 crystalloid oscillation converter; changes oscillatory movement into electric energy. Converter used in study of sea-floor earthquakes & prospecting. 1966.
Confidential (4) CIA 1147638

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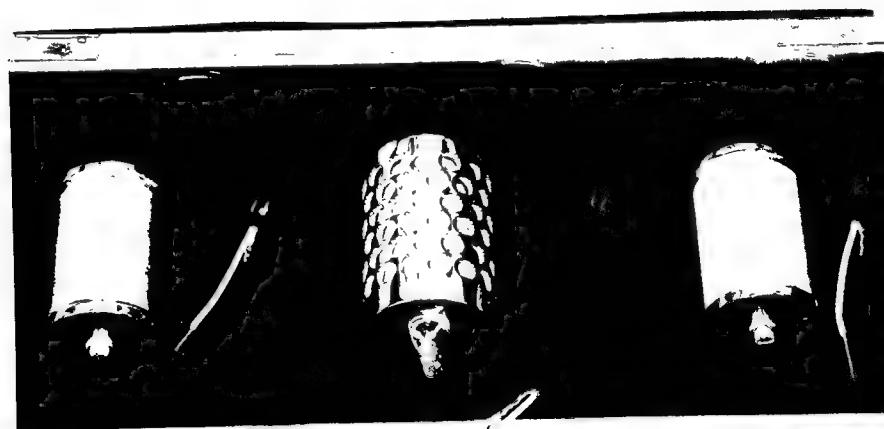
Chicom manuf. earthquake oscillation converter. By means of radio-activity & refraction, it converts movements of earth's surface into electricity. 1966. Confidential (4) CIA 1147639

WJM

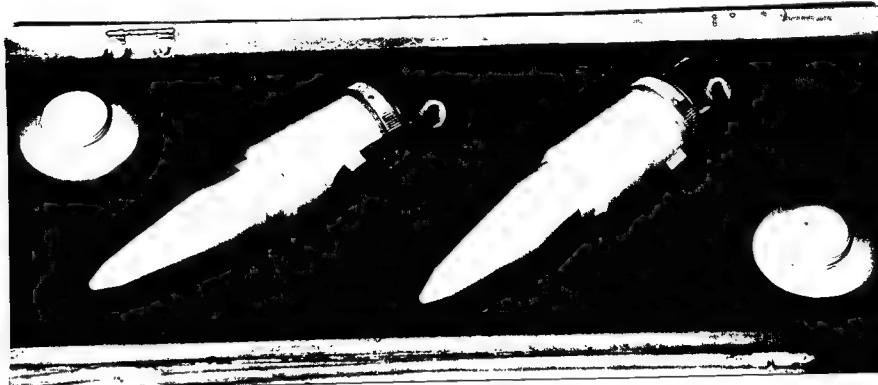
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CHINA [REDACTED] NAN-CHING 32 03 N 118 47 E
Members of Geol. Dept at Nan-ching Univ. studying maps showing granite
formations in S. China. 1966.
Confidential (4,8,9) CIA 1147640

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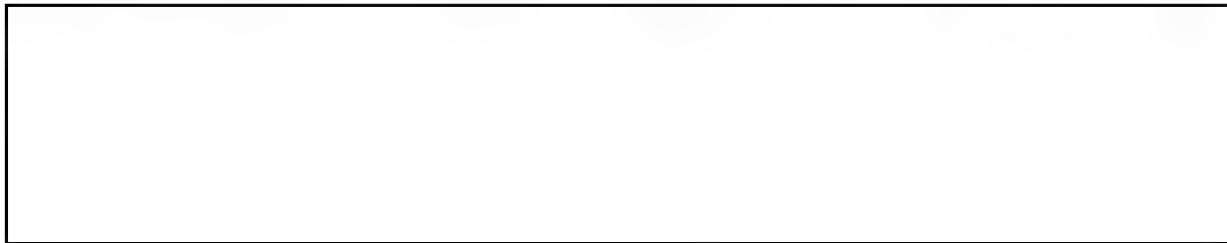
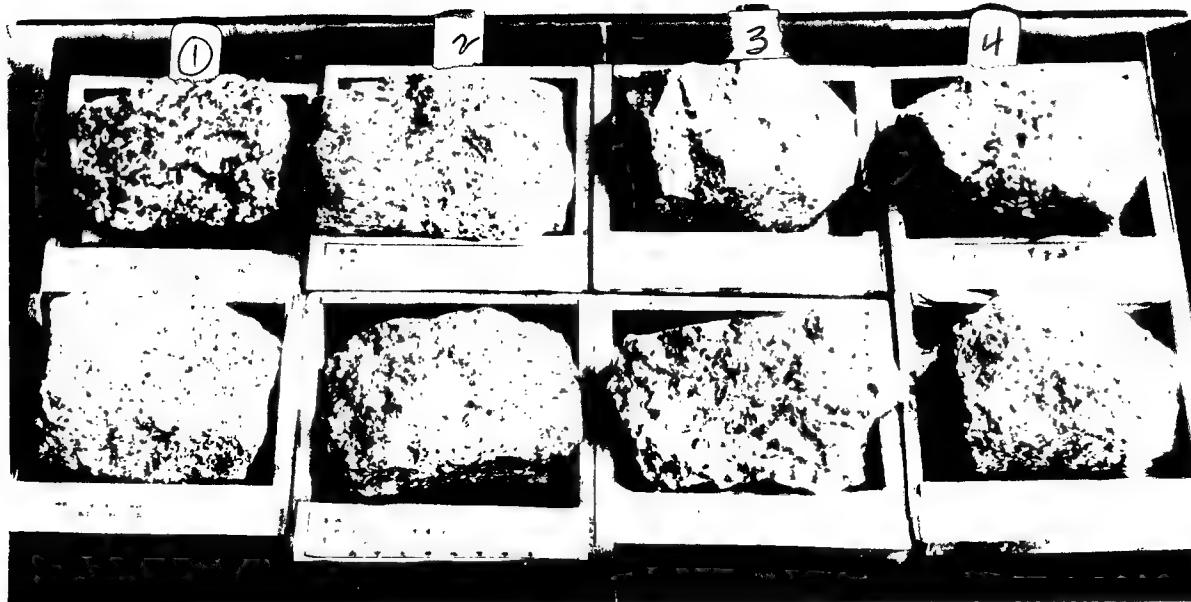
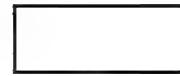
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CHINA
Samples of S. China granite (1st row) Hsueh-feng period (600-800 mill.
yrs. ago) (2nd row) Caledonian period (380-480 mill. yrs) (3rd)
Indonesian period (180-230 mill yrs) (4th) Yen-shan period (90-180 mill.
yrs ago). 1966. Confidential CIA 1147641

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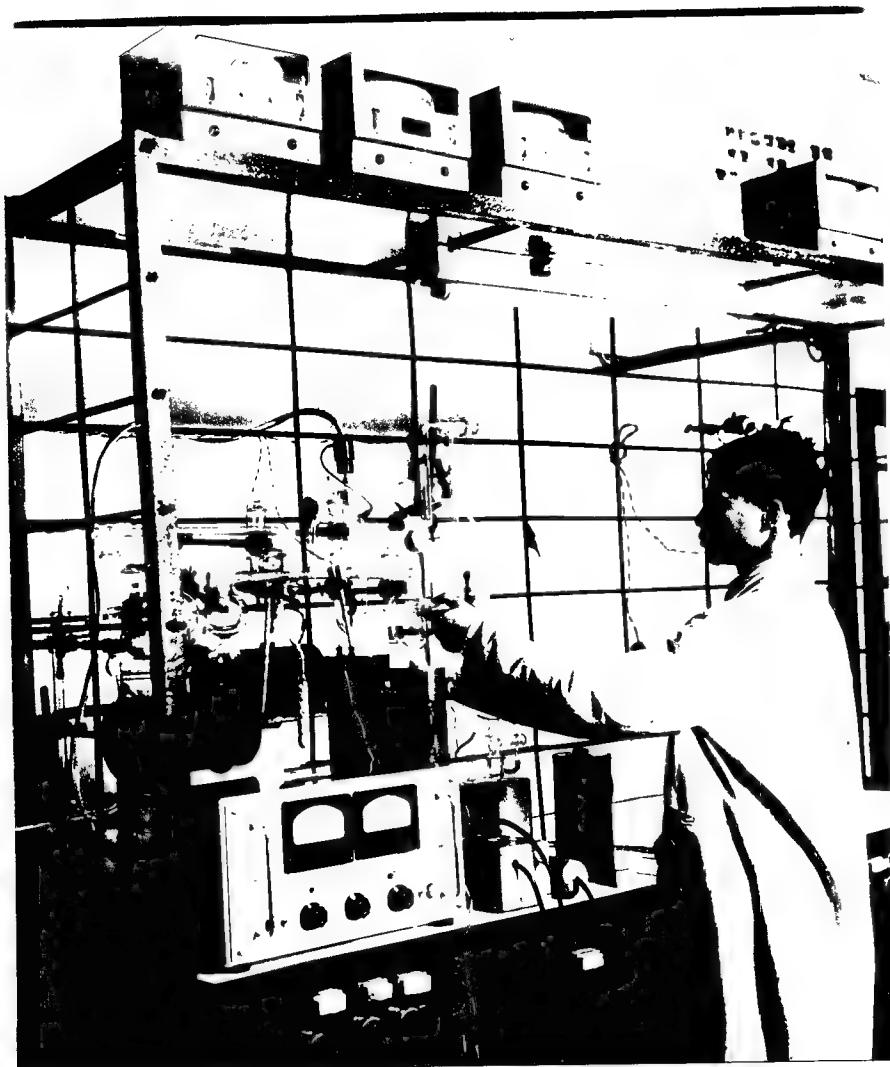
Approved For Release 2003/12/19 : CIA-RDP78-04546A003200020006-1

25X1 CHINA [REDACTED] NAN-CHING 32 03 N 118 47 E
Instrument used to measure absolute age of granite at Nan-ching Univ.
Dept. of Geol. 1966.
Confidential (4,8,9) CIA 1147642

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fact A.

EXPANSION OF NEW CHINESE
MADE PRODUCTION PROCESS

ESTABLISHMENT, EXPANSION, & IMPROVEMENT
OF CHEMICAL FERTILIZER INDUSTRY

Following is a translation of an article in
the Japanese language booklet Photos & Features on Chinese Industry, No 55, November 1,
1965, pages 1-12

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Chemical fertilizer supports good harvest.

The harvest of wheat in China this year registered the record output per unit land in many regions. Also, the good harvests of rice and other agricultural products were reported to be obtained. These good harvests were recorded despite unfavorable climate. Chief reasons for this success of agricultural production are believed to be attributable to a large scale land reform, establishment of a model farm, wide-spread use of good quality crops, improvement of cultivation techniques, and especially the increased output of chemical fertilizers.

The production of chemical fertilizer in the first quarter in this ~~year~~^{YEAR} exceeds that in the same period in the last year by 68%, and also exceeds that in the last quarter in the last year by 24%. It is also noteworthy that the chemical production in the first two quarters in this year exceed that in the same period in the last year by 60% or 1.6 millions tons. This tremendous increase in chemical fertilizer production supports the current increase in agricultural output.

Establishment of large and medium size plants of chemical fertilizers.

Within the first half of this year, the construction of 28 chemical fertilizer plants have been completed in China and they started operating.

The ammonium compound capacity output in these plants are equal to 72% of the total ammonia output in 1964. Twelve plants among these are of medium and large scale plants and located in Huanan, Huapei and Chungnan area, specializing in production of bicarbonate ammonia, ureas and liquid

SP = Phosphorus

ammonia.

These new plants include the Shanghai urea plant (with capacity output of 40,000 tons per annum), the Nanking bicarbonate ammonia plant (with capacity output of 100,000 tons per annum), the Kaifeng chemical fertilizer plant (with capacity output of ammonium compounds of 25,000 tons and ammonium sulfates of 100,000 tons per annum), the Sinyang phosphor fertilizer plant (with capacity output of 50,000 tons), the Kwangsi phosphor fertilizer plant (with capacity output of 100,000 tons) and the Hopei chemical fertilizer plant (a large size ammonium fertilizer plant). These plants form a chemical fertilizer industrial center in China. These plants were constructed since the Shanghai chemical plant started its operation in November, 1962 and China received no outside aid. This means that China now has a capability to build a large scale chemical fertilizer plant without any outside help. At the same time, other chemical fertilizer plants in Kirin, Taysan, Lanchow, Taliens, Szechuan, Nanking and Shanghai, which were under construction during the first five year plant, were expanded and improved their technical standards. These expansion program was carried through by increasing productivity per man-hour. For example, in the Lanchow, Taliens and Kirin plants, approximately 10,000 workers were reduced from the working force, and they were sent to other factories to strengthen their labor force. This labor saving was attributed to the successful man-power management, production process control and reorganization plan. Also, it should be noted that efficient production in these 14 large and medium plants caused an increase of the total output of ammonium compounds per day in this year over that in the peak production period of and the same period of the last year by 10% and 50% respectively.

The Nanking chemical fertilizer plant registered an increase in the output of nitrogen and phosphor fertilizers by 80,000 tons during the first half of this year, which helped reducing the production cost per unit by 11%. The sulphuric acid section of the plant succeeded in increasing its output per day from 280 tons to 380 tons, while the ammonium compound section increased the daily output substantially. The Shanghai chemical plant applied approximately 20 advanced technological devices to the factories, through which the production capacity of the plant increased by 60% over that in the initial period and that plant registered its daily output approximately twice over the last quarter of the last year.

Potential in the medium and small factories.

The expansion of the production capacity is witnessed not only in large plants, but also in the medium and small chemical fertilizer factories. These small and medium factories succeeded in replacement of old technology with the new technology and advanced the technical and economic standards such as saving in raw materials, production cost, and power consumption and higher labor productivity.

Technical advisory group made a series of experiments from one factory to another, thus helping the expansion of production capacity of such factories. For example, in the past the amount of phosphor contents within the superphosphates produced in the phosphor fertilizer factories ran around 17-18%. Therefore, a group of experts consisting of scientists from research centers and university made a production control experiment in the Nantung phosphor fertilizer factory and succeeded in increasing the phosphor content within the superphosphates up to 20%. This Nantung experiment is now widely

utilized to many factories in the nation, helping production of quality superphosphates.

Modernization program in the Kirin chemical fertilizer plant.

The first stage construction of a largest chemical fertilizer plant in China--the Kirin plant(with capacity output of ammonium compound of 200,000 tons per annum and ammonium nitrates of 300,000 tons per annum) -- started in 1957 with a Russian technical aid. The second stage construction of the plant(with capacity output of ammonium compound of 200,000 tons) was completed in 1963 without the Russian aid. The third stage construction of the plant(with capacity output of ammonium compound of 200,000 tons) is expected to be completed by the end of 1965. The People's China changed somewhat the original construction plan suggested by the Russian technical advisors and succeeded in saving the construction expense by approximately 15 million dollars.

This ammonia synthesizing plant has two processing sections -- cleansing process and synthesizing process. The Russian advisors recommended a use of salt of cupric hartshorn as abluent in cleansing process during the first stage construction of the plant, whereas, the Chinese experts found it very inefficient and uneconomical, and recommended the use of salt of cupric acetates, thus resulting in a greater efficiency of production. The use of salt of cupric hartshorn requires 7 cleansing units, with cost of 9 million dollars, while the use of salt of cupric acetate requires only one cleansing unit with cost of 1.5 million dollars. The Russian method requires double cleansing processed, while the Chinese method requires only once of such process with higher degree of purifying capacity by 90% over the Russian method. As a result, in the second and third stage construction, unnecessary cleansing towers were converted into synthesizing towers.

The synthesizing process was also modified from the original design suggested by the Russian experts. The Russian suggested the construction of 9 synthesizing towers and 3 cleansing towers, but the Chinese modified this plan and constructed 4 synthesizing towers only. This experience in the Kirin chemical fertilizer plant was widely utilized in the construction of other plants in China.

Development of new process in phosphor fertiliser plants.

In the past, the Chinese phosphor fertilizer industry could produce only two kinds of products -- super phosphates and soluble phosphor fertilizers. In the past year, several experiments were conducted and now the Chinese industry is able to produce ammophos, heavy superphosphates, ammonium superphosphates and nitro-phosphor fertilizers. The Chinese are approaching a state of "self reliance" in the production of such chemical fertilizers.

The workers in the Tsuyan phosphor fertilizer plant in Szechuan province attempted to modernize the production process of superphosphates and dropped "dry dilute acid method" and adopted "wet paste saturated acid method". This new method increased an efficiency in production, improving the phosphor contents within the superphosphates and resulting in cost reduction per unit.

When the Nanking chemical fertilizer plant produced nitric phosphorus fertilizer on an experimental basis in 1964, "non-reaction ratio" was 20 (this is a ratio of imput units not reacting to a chemical process over ~~in~~

put units reacting to the chemical process). In other words, the majority of input units must be processed again to produce the phosphor fertilizers and this was very inefficient and uneconomical process. Therefore, since then, the plant experts attempted several experiments with cooperation from the Shanghai technical institute and finally succeeded in reducing this "non-reaction ratio" from 20 to 2-3. As well as this experiment in Shanghai, the Chengtu technical institute with cooperation from the Nanking chemical fertilizer plant succeeded in producing nitro-phosphor fertilizer from the medium grade phosphor ores, with a relatively low contents of phosphors.

The Shanghai chemical research center developed a new production process of superphosphates. Namely, the center attempted a laboratory experiment to produce superphosphates of lime from the phosphoric acid produced from the Chinese phosphor ores. Then, the center applied this superphosphates in the fields and found the experimental fertilizer of good quality. This experiment was reviewed by the Chinese chemical experts in Peking, Shanghai, Nanking, etc, and a conclusion was drawn that this experimental process is applicable to the large scale production of the superphosphates.

The Nanking chemical research center also succeeded in producing ammonium superphosphate of lime. This is produced by mixing superphosphates of lime with a small quantity of ammonium gas and the final product is believed of superior quality than the ordinary phosphor fertilizer and contains effective phosphor of 16-17.5% and nitrogen of 2.5-3%.

Easy and economical new production process of nitrogen fertilizer

KIAWEN
The easiest success and most widely accepted experiment in developing new production process in chemical fertilizer in China is that of the Tanyang chemical fertilizer plant in the Szechuan province. This experiment was developed by a noted Chinese chemist Hou Te-Pang several years ago. This new process is much simpler compared with the traditional method and requires much less equipment and construction materials. This new production process also saves raw materials and power consumption. Thus, it attracted a wide attention and the engineers from the Peking chemical engineering institute under the guidance of Hou Te-Pang started designing the construction. The Tanyang chemical fertilizer plant started during this campaign.

As soon as this new process was applied to a large scale production, however, many unexpected problems occurred, for example, the difficulty of production process control and breakdown of pipe lines and inferior gas products, etc. Because of such difficulty, this new process were unfortunately proposed to be given up and many experts recommended to redesign factories under construction according to this new production process to the traditional process.

Conquering the difficulty in the Tanyang chemical fertilizer plant.

A group of engineering experts from chemical industrial circle and the Tanyang plant, however, had a different opinion about the difficulty encountered in other plants in developing this new production process of nitrogen fertilizer. They argued that the conversion of the plant into the traditional method would reduce the production capacity by 30% and cost additional investment, coupled with a greater power consumption expense. Therefore, this group of experts advised to continue experiments based on the new process to conquer the difficulty without converting their plant into the

traditional process. Thus, they completed the construction of the Tanyang chemical fertilizer plant based on the new process, while many other plants were gradually converting their facility into the traditional process.

But once this new plant started its operation, they were faced with the same problems encountered by the predecessors and additional problems. That did not stop their efforts. They were determined to find the solution to these problems and analyzed each problems step by step and conducted over 100 experiments within half of a month. Thus, they combined the revolutionary spirit with the scientific pursuit, and finally succeeded in conquering these difficult problems.

The annual capacity output jumps 4 times in the Tanyang chemical fertilizer plant.

On succeeding in adoption of the new process into a large scale production, the Tanyang chemical fertilizer plant increased the daily output. The plant produced the ammonium compounds of 2,600 tons and bicarbonate ammonia of 10,000 tons in 1963, which were above the original goal of output (2,000 tons of ammonium compound per annum). Further expansion program in this plant pushed its annual production level up to 5,000 tons of ammonium compounds and 20,000 tons of bicarbonate ammonia by the end of 1964. Moreover, the workers of the Tanyang plant managed to replace the old ~~pipelines~~ pipelines causing that difficult problem with the new pipeline which they manufactured by themselves, thus increasing the annual production level up to 8,000 tons of ammonium compound and 32,000 tons of bicarbonate ammonia.

This new experiment in the Tanyang plant gave a great incentive to other factories and since then, many other factories which were under conversion from new process to old process again reversed the trend and adopted this new production process.

Naturally, the Tanyang plant became the center of the training program for such new technical achievement and trained so far more than 1400 engineering workers and also extended a pioneering team for other new factories to be built in this new method.

A great role of local small and medium chemical fertilizer plant in improving agricultural production.

There are about 30 small nitrogen fertilizer plants equipped with the Tanyang process and many are under construction. The share of these small and medium plants' production are gradually becoming great in the total chemical fertilizer production in China. These plants are located in each farming village and in this sense, it plays a great role to providing the necessary fertilizer to each local farming community. For example, the Tanyang plant provided about 40,000 tons of bicarbonate ammonia and several thousands tons of liquid ammonia to the local farmers. The use of such chemical fertilizers is phenomenal, showing seven-fold increase between 1961 and 1964. Thus, combined with mechanization of farming, this province enjoyed a good harvest for the last four years, showing a 78.6% increase of farm production between 1961 and 1964. A similar increase of farming production is registered in the neighboring provinces and prefectures of Shanghai and Chekiang province.

These small factories are located right in the farming areas, and thus eliminate a problem of transportation and most of the equipment are manufactured locally.

Spelling

New construction of
Within this one year
plants was completed and in
Liaoning province. Thus,
in this province increased
program, the annual output
from 10,000 tons of superphosphate.

Similar increases in
Luta plant from 500 kg per ton.

Following is a summary
of plants in each province.

~~HEILUNGKIANG~~ ~~HEILUNGKIAH~~

Inner Mongolia: Several new plants are under construction.

Inner Mongolia: The first chemical fertilizer plant, the Chasuchi plant, has started its operation and its expected output per annum is 2,000 tons of ammonium compound.

The Shantung province: Four chemical fertilizers plants are under construction. The first plant, Shenghsien bicarbonate ammonia plant (with capacity output of 20,000 tons), has been completed and started its operation. This plant was designed by the Shantung chemical engineering institute.

Anhwei province: Eight small chemical fertilizer plants underwent technical improvements, through which the capacity output increased two-fold over the last year, producing more than 10,000 tons of ammonium compounds within the first five months of 1965.

Seven out of eight plants have already completed their technical improvement and their annual capacity output of ammonium compound jumped from 9,000 tons to 20,000 tons.

The technical improvement in Feihsia, Tien-tung, and An-chiang chemical fertilizer plants reduced the production cost of ammonium compounds per ton by 60%. This production cost reduction benefited the farmers in this area by reducing the sales price of the fertilizers.

JIANGSU Chiangsu province: The Chiangning plant and the Chuhua plant completed their expansion construction and started its operation. The annual production of bicarbonate ammonia of these plants increased from 3,000 tons to 7,000 tons after the expansion project. Beside these two plants, there are about 20 other new plants which are under construction in this province. Moreover, in this province, there are 41 machine factories which supply 2,000-5,000 tons of small ammonium compound plants.

Hunan province: In 1964, the construction projects of Changsha and Chinchia phosphor fertilizer plants and Changsha nitrogen fertilizer plant, Liyang phosphor fertilizer plant (completed and the total capacity output of these plants are 160,000 tons of phosphor and nitrogen fertilizer per annum).

Fukien province: The chemical fertilizer production in this province in 1964 increased 2.5 times over the previous year and the production cost went down by 30%. This is primarily due to the expansion in the last year of seven plants which were under operation since 1963. Also, there are many new plants which are under construction in this province. If these plants start operation, their total output of liquid ammonia, superphosphates of lime and soluble phosphor fertilizer will be 12,000 tons per annum. These

Cha-su-chi
SHENGHSIEN BICARBONATE

New construction of small chemical fertilizer plants

Within this one year, the construction of 11 nitrogen fertilizer plants was completed and 2 phosphor fertilizer plants were expanded in the Liaoning province. Thus, the production capacity of chemical fertilizer in this province increased 4-5times over the last year. After expansion program, the annual output of the Heishan phosphor fertilizer factory jumped from 10,000 tons of superphosphates of lime to 50,000 tons.

Similar increases of production capacity were registered in the Luta plant from 500 Kg per day of ammonium compound to 6 tons per day.

Following is a summary of new construction of chemical fertilizer plants in each province.

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construction of new plants are designed by the engineers in the province and their equipment also are manufactured within the province. These new plants are expected to produce high quality products with least cost of production.

Kuangtung ~~Kwangtung~~ province: There are about 40 plants scattered around this province. The new plants which were just built in this year have production capacity of 300,000 tons. Additional seven new phosphor fertilizer plants completed construction and started operating in August, 1965. The chemical fertilizer output during the first eight months in 1965 exceeded the total output in 1964(over 500,000 tons).

Kiangsi ~~Kiangsi~~ Kumghsi province: There are 10 chemical fertilizer plants in this province and their capacity output is 259,500 tons as July, 1965. The output in 1964 was 2.6 times over 1959. The output in the first eight months of 1965 is 3.8 times over the same period of 1964. The quality of the products is up to the national standard and producion cost is considered very low.

Kweichow province : In 1964, the first modern nitrogen fertilizer plant in this province, Chienhang plant was completed and in this year, another modern plant is under construction. The output of phosphor fertilizer in the first 12 months of this year recorded 6 times over the same period of the last year. This province had 4 soluble phosphor fertilizer plants in the past, but now additional two new plants are under construciton.

Yunnan province: There are 13 chemical fertilizer plants in this province, of which 13 plant produce phosphor fertilizers and one plant produces bicarbonate ammonia. Since 1957, the kinds of chemical fertilizer increased from one to eight, and a great quantity of superphosphates of lime are produced here.

The six soluble phosphor fertilizer furnaces which had been under construction started their operation this year and thier capacity output is expected to be 123,000 tons. Therefore, the total output of phosphorus fertilizer in this province will jump from 70,000 tons in the last year to 200,000 tons in this year.

There are additional six soluble phosphor plants which are under construction and upon their completion, the output of soluble phosphor fertilizer in this province will be three times over than now.

As shown above, Chinese chemical fertilizer industry is undergoing a great deal of change. The bicarbonate liquid ammonia produced by small plants are welcomed by farmers because of their inexpensive price. The use of the liquid ammonia is easy to handle. The use of nitrogen of lime and urea also are spreading in the nation. The phosphor fertilizer used to be limited to the superphosphates of limes, but nowadays soluble phosphor fertilizer are replacing these, and contributing to the improvement of the farming soils. The phosphate acid ammonia and nitro phosphor fertilizers are expected to be produced shortly in these small and medium plants. Thus, the development of the chemical fertilizer industry in China is making a great contribution toward a better harvest.

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CSO: DC-12322

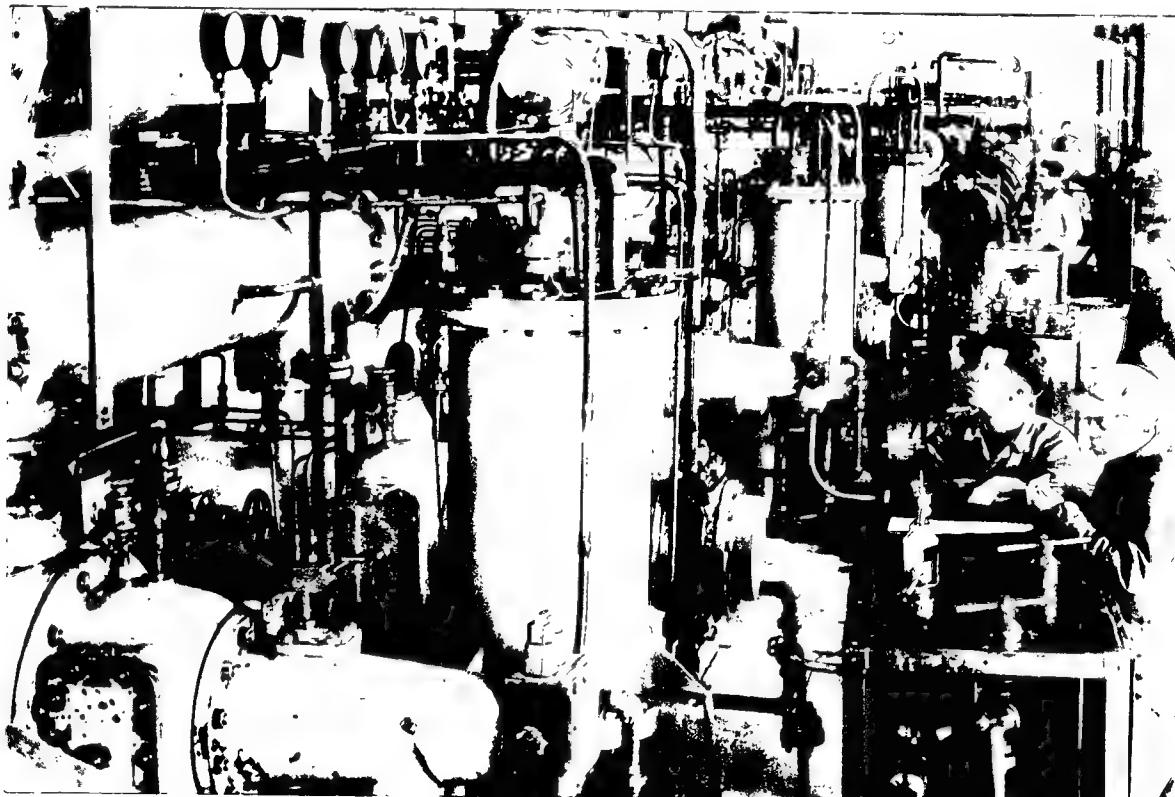
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25X1 CHINA [redacted] TAN-YANG 32 00 N 119 35 E
High pressure mach. wkshp of Chem. Fert. Plt. Plt. currently prod.
8,000 T of synthetic ammonia and 32,000 T of ammon. bicarbonate.
25X1 [redacted] 1965
CONFIDENTIAL (15,21,24) CIA 1087585

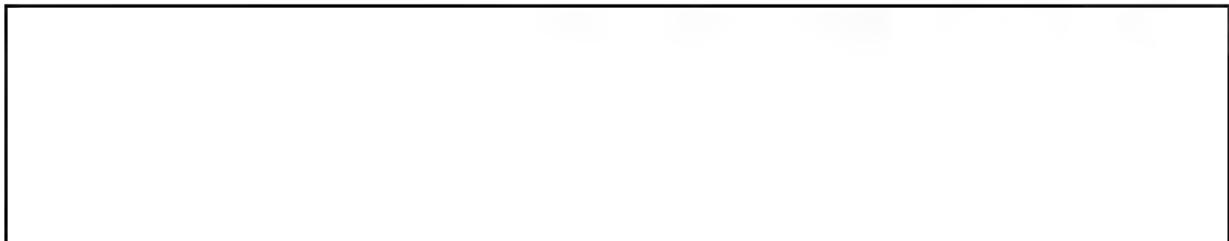
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CHINA WAC 498C YUNG-CHUN 25 19 N 118 17 E
Chem. Fert. Plt. As of Apr. 65, prod. 30t. fert. daily. [redacted]
1965
Confidential

(7,15,24)

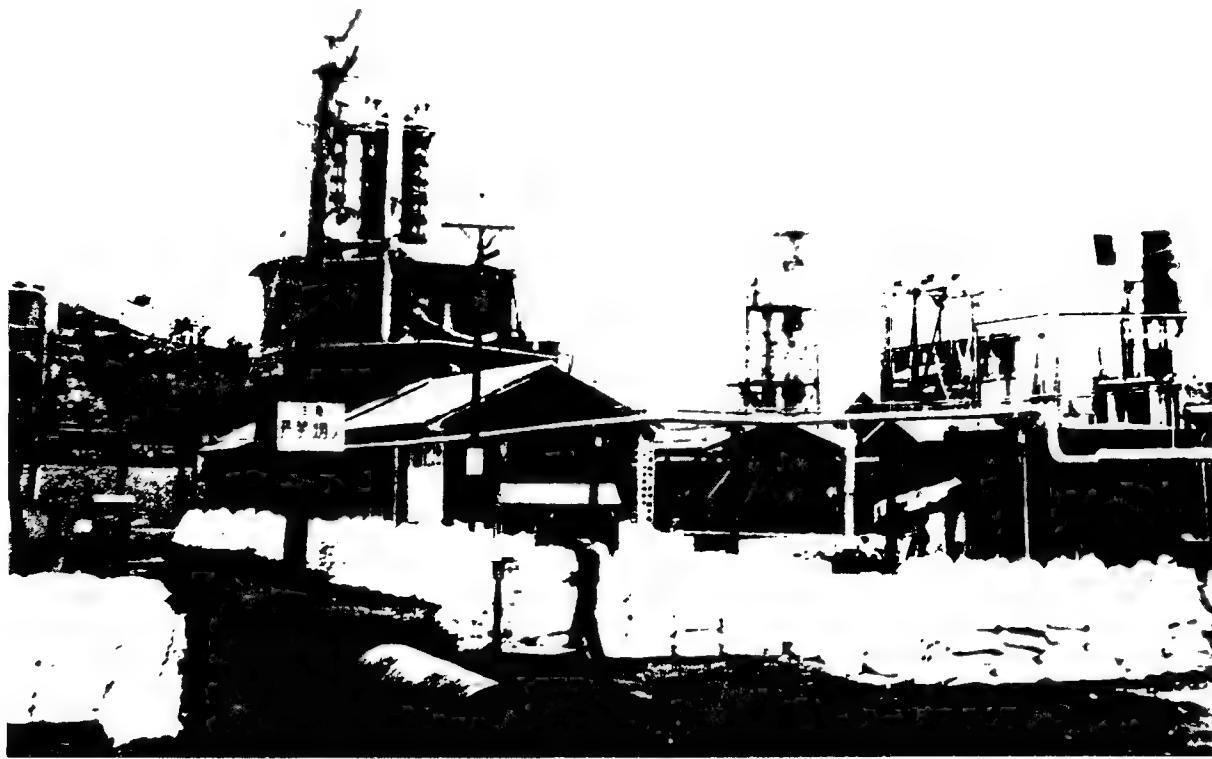
CIA 1087586

25X

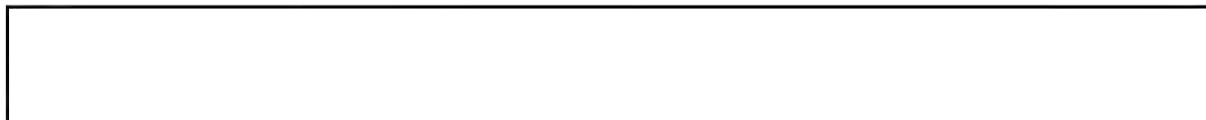
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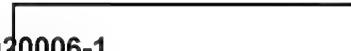


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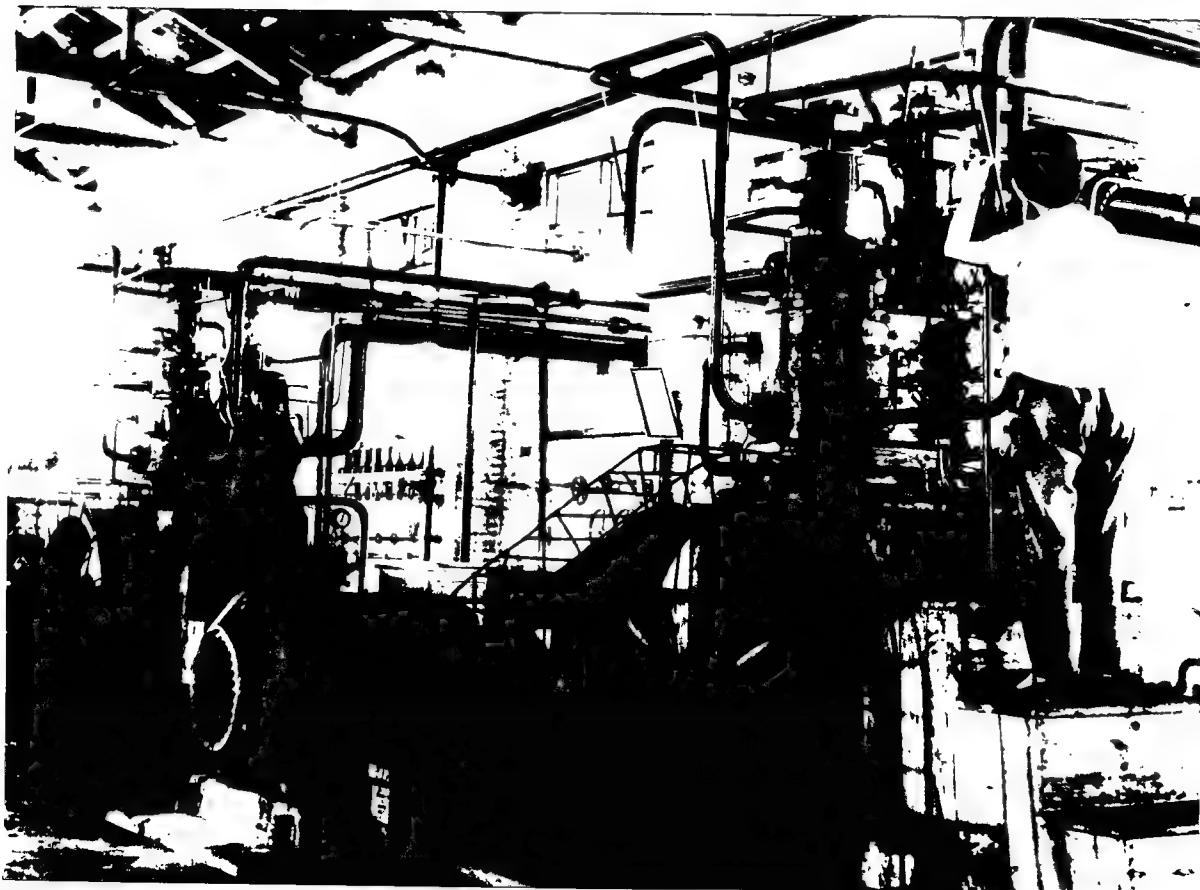
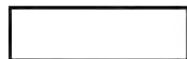
CHINA WAC 498C CHANG-CHOU SHIH 24 31 N 117 40 E
Eqpt. at refinery of Lung-hai Synthetic/Ammonia Plt. Future prod. -
2,000T./Yr. [redacted] 1965 (15,25)

CIA 1087587

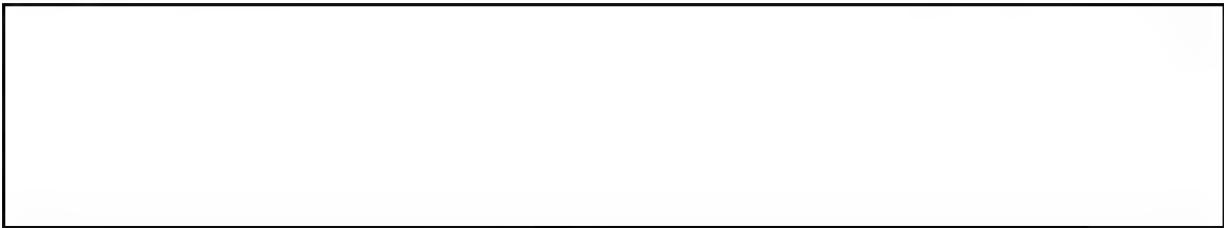
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25X1

CHINA [redacted] KUN-SHAN 31 23 N 120 57 E
Synthetic ammonia wkshp. of Chem. Fert. Plt.; prod. 5,000T./Yr.

25X1

[redacted] Confidential

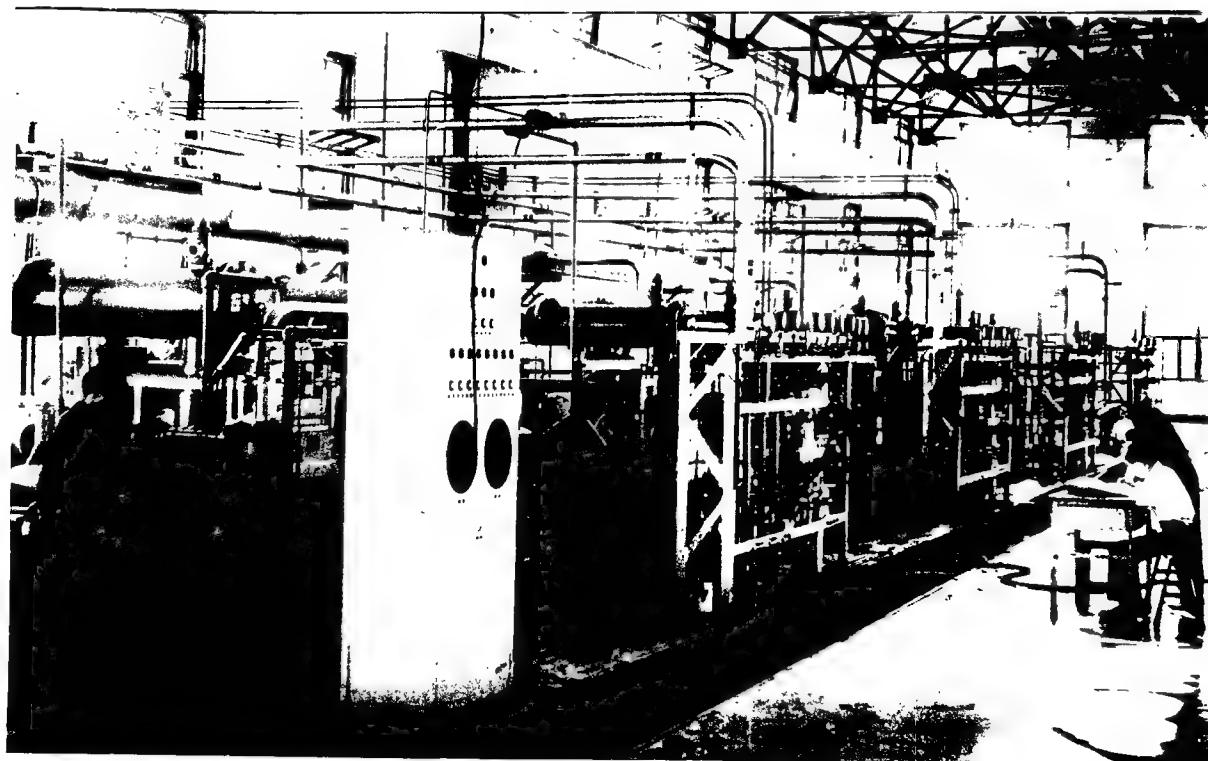
(15,25)

CIA 1087588

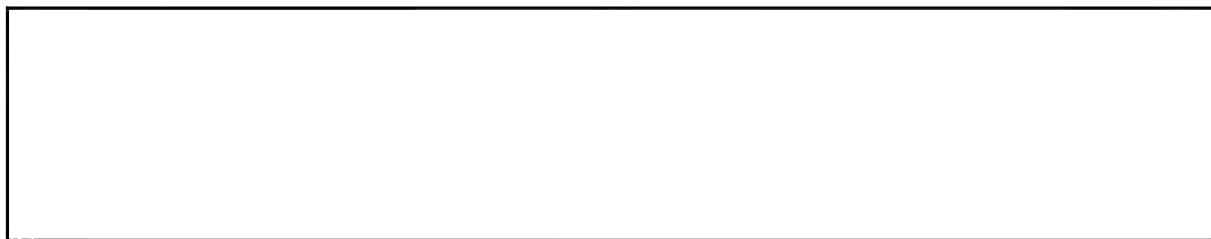
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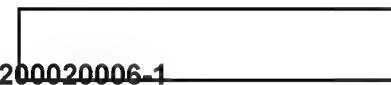


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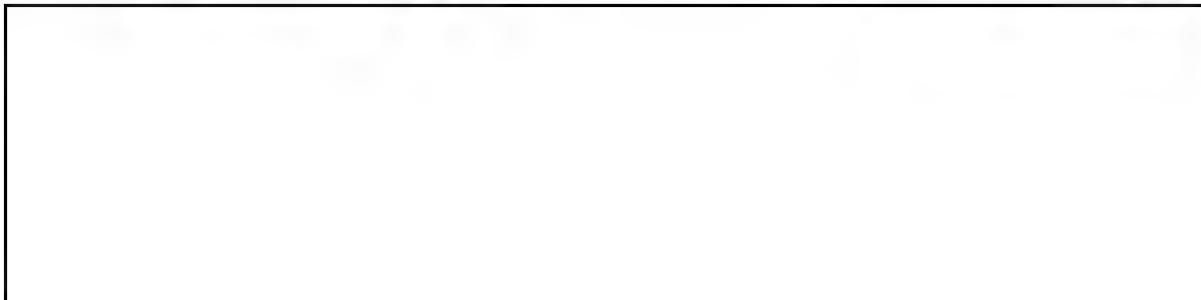
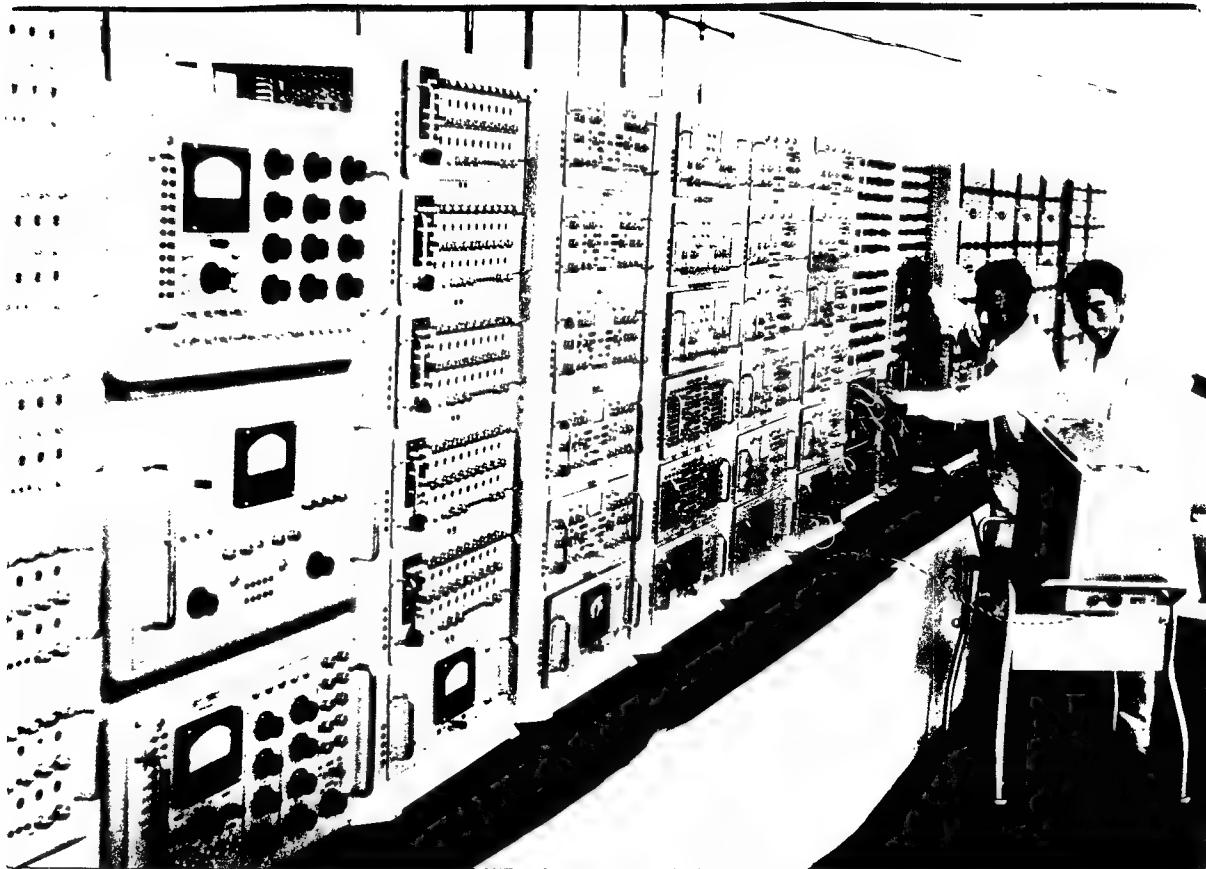
Approved For Release 2003/12/19 : CIA-RDP78-04546A003200020006-1

CHINA WAC 381A TIENTSIN 39 08 N 117 12 E
24 step medium size electronic analog computer manufactured by Tientsin
Electronic Instruments Plant. Jen-min Jih-pao, Peiping, 10 July 1965
Official Use Only (4,23) CIA 1061489

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1
25X1 CHINA [redacted] HA-ERH-PIN INDSTRL UNIV. 45 45 N 126 36 E
25X1 Univ. tool microscope in Prec. Mach. Lab.; shows analysis on errors in
pinion gear. [redacted] 1965 (9,21) CIA 1087583
Confidential

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Approved For Release 2003/12/19 : CIA-RDP78-04546A003200020006-1

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Universal tool microscope installed in the Precision Machinery Laboratory of Harbin Industrial College. The photograph shows an analysis being made of errors in a pinion gear.

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25X1 CHINA [REDACTED] SHANG-HAI 31 14 N 121 28 E
Microscale calibrated to handle minim. 1 microgr. to max. of 2 gr manuf.
by Tien-ping Instrum. Plt. [REDACTED] 1965
Confidential (4,21,25) CIA 1087584

25X1

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Microscale - calibrated to ~~weight~~ accommodate a minimum of one microgram and a maximum of two grams - recently manufactured by the Tien-p'ing Instrument Plant, Shanghai.

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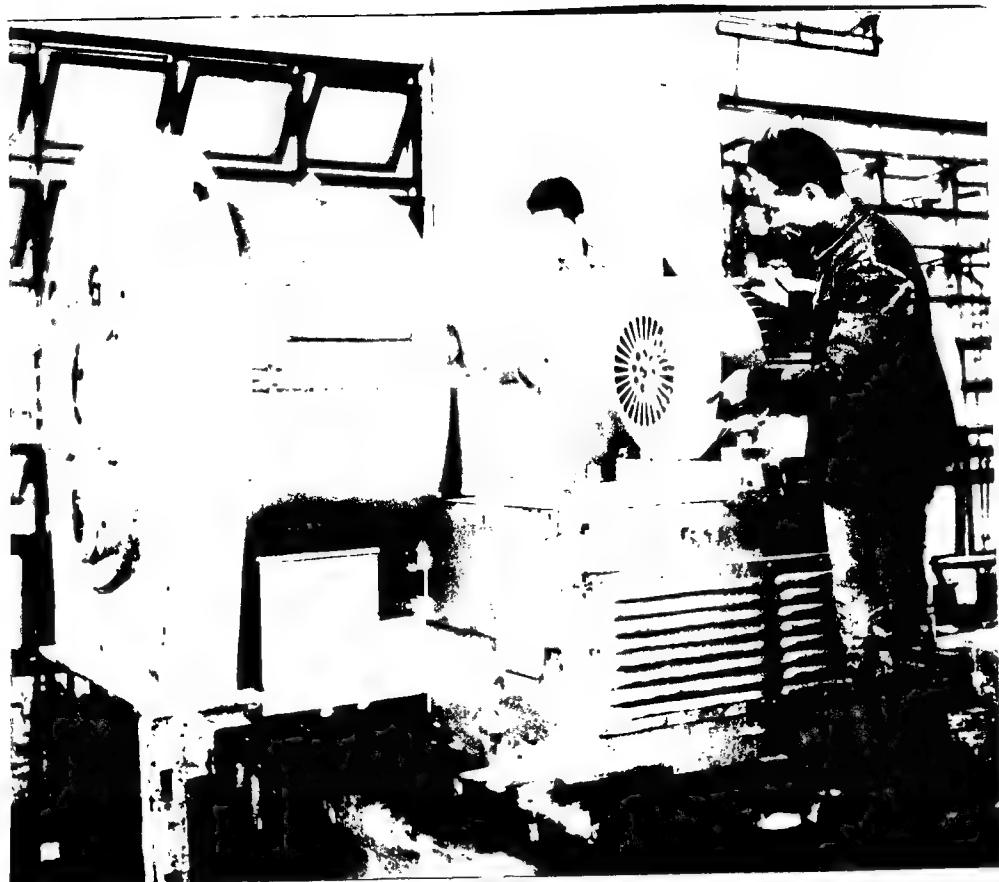
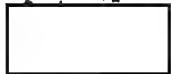
25X1 CHINA [redacted] KUANG-CHOU 23 08 N 113 17 E
800mm. horiz fully autom. centrifugal separator manuf. by Fan-yung Mach.
and Eqpt. Plt. Prod 4-5T. of nitrogenous. fert./hr. [redacted] 1965
Confidential (21,24) CIA 1087589

25X1

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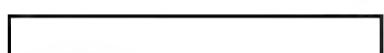
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800 mm horizontal fully-automatic centrifugal separator manufactured by the Fan-yung Machinery and Equipment Plant, Canton. This centrifugal separator, which is vital to the operation of nitrogenous fertilizer plants, is capable of producing 4-5 tons of nitrogenous fertilizer per hour.

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25X1

CHINA [REDACTED] SHANG-HAI 31 14 N 121 28 E

25X1 Chem. fert. manuf. eqpt. prod. by Hsin-chien Mach. and Eqpt. Plt. being
loaded at dock. [REDACTED] 1965

Confidential (15,21,24,30)

CIA 1087590

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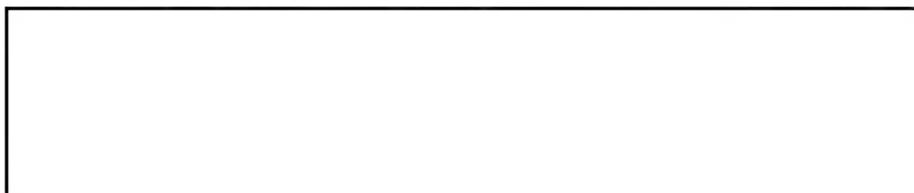
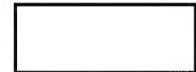
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The Hsin-chien Machinery and Equipment Plant in Shanghai supplies huge quantities of equipment to oil refineries and chemical fertilizer plants in various areas throughout China. This photograph shows one type of chemical fertilizer manufacturing equipment being loaded for delivery.

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Shanghai.



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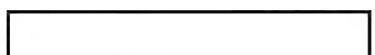
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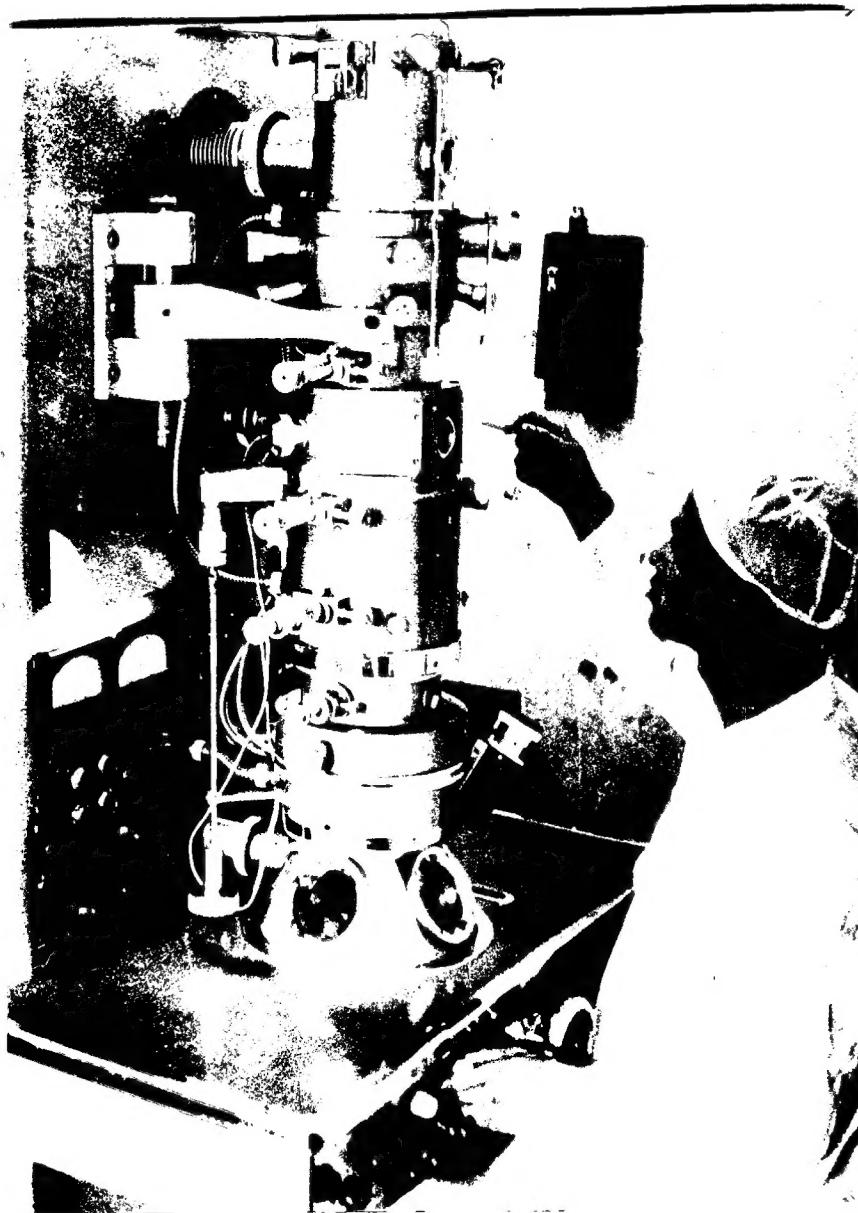
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